

UNITED STATES PATENT APPLICATION

of

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for

**APPARATUS AND METHOD FOR AIRBAG CURTAIN
MODULE WITH SECONDARY ATTACHMENT DEVICE**

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1 **APPARATUS AND METHOD FOR AIRBAG CURTAIN**
2 **MODULE WITH SECONDARY ATTACHMENT DEVICE**

3 **BACKGROUND OF THE INVENTION**

4 **1. Field of the Invention**

5 The present invention relates to an airbag curtain module with a secondary
6 attachment device. More specifically, the present invention relates to a novel apparatus
7 and method for securing two separate longitudinal portions of a folded airbag curtain to
8 the interior of a vehicle.
9

10 **2. Description of Related Art**

11 Inflatable safety restraint devices, or airbags, are mandatory on most new
12 vehicles. Airbags are typically installed as part of a system with an airbag module in the
13 steering wheel on the driver's side of car and in the dashboard on the passenger side of a
14 car. In the event of an accident, a sensor within the vehicle measures abnormal
15 deceleration and triggers the ignition of an explosive charge contained within an inflator.
16 Expanding gases from the charge travel through conduits and fill the airbags, which
17 immediately inflate in front of the driver and passenger to protect them from harmful
18 impact with the interior of the car. Airbag systems have also been developed in response
19 to the need for similar protection from lateral impacts between a passenger and the side of
20 a vehicle's interior. This might occur when another vehicle collides with the side of the
21 car, or in a rollover situation where the side of car is repeatedly impacting the ground.

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Figure 4 is a side cross-section view of the airbag curtain module of Figure 3 along line A-A with a first dangling position of the module shown in phantom.

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1 present invention, as represented in Figures 1 through 4, is not intended to limit the scope
2 of the invention, as claimed, but is merely representative of presently preferred
3 embodiments of the invention.

4 With particular reference to Figure 1, an airbag module utilizing the present
5 invention is generally designated at 10. The airbag module 10, includes an inflatable
6 curtain 12 having a first edge 14 and a second edge 16. The curtain 12 is typically
7 configured of 2 pieces of semi-permeable material attached to each other by means
8 known in the art. The pieces may be attached to each other at seams 18 to form distinct
9 chambers 20, each of which will retain inflation fluid such as gas produced by an inflator
10 (not shown).

11 The airbag module 10 also includes a covering 22. The covering 22 is preferably
12 configured to at least partially enclose the inflatable curtain 12 in a folded state. The
13 covering 22 may be substantially as long as the curtain 12. In the preferred embodiment
14 of the curtain 12 illustrated in Figure 1, the covering 22 is attached to the curtain 12 along
15 a stitch line 24. The covering 22 may be configured to permit a first edge 26 of the
16 covering 22 to be attached along a second edge 28 of the covering 22 about the curtain 12
17 when the curtain 12 is in a folded state.

18 The curtain 12 includes a plurality of first attachment members 30 spaced along
19 the first edge 14 of the curtain, the first attachment members 30 allow a first portion 32 of
20 the module 10 to be secured to the interior of a vehicle. The first attachment members 30
21 may be configured with an opening 31 to receive a connector such as a screw, bolt, rivet,
22 pin and the like, for attaching the module 10 to a roof rail of the vehicle interior. In an
23 alternative embodiment, the first attachment members 30 may be attached to the vehicle
24 interior by adhesive, bonding, welding, and the like. In the embodiment illustrated in
25 Figure 1, the attachment members are tabs 30. The tabs 30 extend from the first edge 14
26 of the curtain airbag 12 such that after the curtain 12 is in a fully folded state, the curtain

3) of a vehicle the second attachment members 36 are secured to the covering 22 are positioned below the first attachment members.

The second attachment member 36 is configured to secure a second portion 52 of the module 10 to the interior 40 of the vehicle when the curtain 12 is secured within the covering 22. The second portion 52 is between the first portion 32 and a bottom portion 54 of the module 10 when the module 10 is secured to the interior 40 of the vehicle. Because the module 10, with the curtain 12 retained in a folded state, is long and narrow, the first portion 31 is a longitudinal portion adjacent the first attachment members 30 and the second portion 52 is also a longitudinal portion adjacent the second attachment members 36. Accordingly, once the first portion 31 of the module 10 is secured to the vehicle interior, the module 10 may be pivoted out of the way and attached at the second portion to the interior 40 by the second attachment members 36 (see Figure 4). The dual attachment configuration allows the module 10 to be compactly and efficiently secured within the vehicle.

The second attachment member 36 comprises a magnet 44 positioned within a pocket 46. The magnet 44 is substantially flat and thin for compactness. A plurality of magnets 46 are spaced near the first edge 14 of the inflatable curtain 12. Each magnet 44 may be positioned opposite to, and adjacent to, one of the plurality of first attachment members 30. In a preferred embodiment, the pockets are configured along an outboard side 38 of the covering 22. The magnet 44 has a magnetic field strength which permits the detachment of the magnet 44 from a vehicle interior 40 with minimal force applied by a user. It will be appreciated by those of skill in the art that this allows the module 10 to be detached from the vehicle interior 40 in certain applications without leaving a noticeable hole, mark, or residue at the vehicle interior 40 adjacent the second portion 52 of the module 10.

1 position. For instance, the second attachment members 36 may be offset from the first
2 attachment members 30. Furthermore, the number of second attachment members 36
3 need not equal the number of first attachment members 30. At least one second
4 attachment member 30 should be spaced from the first attachment members is the
5 transverse direction to allow for two separate longitudinal areas to be attached to the
6 vehicle interior 40. In this configuration, the outboard side 38 of the folded module more
7 closely conforms to the configuration of the vehicle interior 40 to which the module 10 is
8 being attached.

9 Referring now to Figure 4, the curtain 12 of the airbag curtain module 10 is first
10 folded into a predetermined configuration. The covering 22 may then be secured about
11 the folded curtain 12. The module 10 is secured by means of the first attachment
12 members 30 to the interior 40 of a vehicle and then the second attachment members 36
13 are secured to the vehicle interior at a position below the first attachment members 30. In
14 this configuration, the second longitudinal portion 52 of the module is below the first
15 portion of the module allowing the module to be attached in close conformity to the shape
16 of the interior 40 piece to which the module 10 is to be secured. Where the second
17 attachment members are magnets, the second attachment member 36 is positioned
18 adjacent a metallic surface to permit the magnetic force of the magnet to secure the
19 module to a vehicle interior. The installer may also decide to first use the magnet 44 or
20 second attachment member 36 to loosely position the module 10 along the roof-rail of the
21 vehicle interior 40 so that it is substantially in place. The installer then has both hands
22 free to secure the first attachment members 30 to the interior 40. The installer may
23 position the second attachment members 36 in their final position.

24 The present invention may be embodied in other specific forms without departing
25 from its structures, methods, or other essential characteristics as broadly described herein
26 and claimed hereinafter. The described embodiments are to be considered in all respects

1 only as illustrative, and not restrictive. The scope of the invention is, therefore, indicated
2 by the appended claims, rather than by the foregoing description. All changes that come
3 within the meaning and range of equivalency of the claims are to be embraced within
4 their scope.

5 What is claimed and desired to be secured by United States Letters Patent is:

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